

What is claimed is:

1. A torque transmitting apparatus comprising:

a differential assembly including a differential case and at least one output shaft;

5 at least one friction clutch assembly for selectively engaging and disengaging said

differential case and said at least one output shaft; and

a hydraulic clutch actuator for selectively operating said at least one friction clutch assembly between a disengaged condition and an engaged condition;

said hydraulic clutch actuator including a hydraulic pump providing a hydraulic fluid

10 under pressure and a hydraulic pressure accumulator selectively communicating with said

hydraulic pump for charging said hydraulic pressure accumulator with said hydraulic fluid

under pressure;

said hydraulic pressure accumulator selectively communicating with said at least one friction clutch assembly for selectively engaging said at least one clutch assembly.

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2. The torque transmitting apparatus as defined in claim 1, further including a housing rotatably supporting said differential assembly and a drive pinion provided for rotating said differential assembly.

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3. The torque transmitting apparatus as defined in claim 2, wherein said hydraulic pump is mounted within said housing about a pinion shaft of said drive pinion.

4. The torque transmitting apparatus as defined in claim 1, wherein said hydraulic pump is a gerotor pump.

5. The torque transmitting apparatus as defined in claim 2, wherein said hydraulic clutch actuator further includes a directional valve provided for selectively directing the hydraulic fluid from said pump to said hydraulic pressure accumulator.

6. The torque transmitting apparatus as defined in claim 5, wherein said directional valve is mounted within said housing.

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7. The torque transmitting apparatus as defined in claim 1, wherein said at least one friction clutch assembly includes a piston assembly provided for setting said clutch assembly in said engaged condition in response to hydraulic pressure from said accumulator.

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8. The torque transmitting apparatus as defined in claim 1, further including a fluid reservoir for storing a supply of said hydraulic fluid, said fluid reservoir is in fluid communication with said hydraulic pump.

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9. The torque transmitting apparatus as defined in claim 2, further including a fluid reservoir disposed in said housing for storing a supply of said hydraulic fluid, said fluid reservoir is in fluid communication with said hydraulic pump.

10. The torque transmitting apparatus as defined in claim 9, wherein said hydraulic clutch actuator further includes a directional valve provided for selectively direct the hydraulic fluid from said pump to said hydraulic pressure accumulator and from said hydraulic pump to said fluid reservoir.

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11. The torque transmitting apparatus as defined in claim 10, wherein said directional valve directs said fluid from said hydraulic pump to said hydraulic pressure accumulator until a pressure within said accumulator reaches a predetermined value and directs said fluid from said hydraulic pump to said fluid reservoir when the pressure in said hydraulic pressure

10 accumulator reaches said predetermined value.

12. The torque transmitting apparatus as defined in claim 1, wherein said hydraulic accumulator is mounted to said housing.

15 13. The torque transmitting apparatus as defined in claim 2, wherein said hydraulic pump is activated in response to rotation of said drive pinion.

14. The torque transmitting apparatus as defined in claim 2, wherein said hydraulic clutch actuator further includes a control valve providing selective fluid communication

20 between said hydraulic pressure accumulator and said at least one friction clutch assembly for selectively setting said clutch assembly in said engaged condition.

15. The torque transmitting apparatus as defined in claim 14, wherein said control valve is mounted within said housing.

16. The torque transmitting apparatus as defined in claim 14, wherein said control valve is a solenoid-operated valve.

17. The torque transmitting apparatus as defined in claim 6, further including a first communication passage integrally formed within said housing for fluidly connecting said directional valve with said accumulator.

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18. The torque transmitting apparatus as defined in claim 15, further including a second communication passage integrally formed within said housing for fluidly connecting said accumulator with said control valve.

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19. The torque transmitting apparatus as defined in claim 14, wherein said control valve is actuated by an electronic control module in response to at least one condition.

20. The torque transmitting apparatus as defined in claim 19, wherein said at least one condition is an activation of an anti-lock braking system of a vehicle.

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21. The torque transmitting apparatus as defined in claim 1, wherein said hydraulic clutch actuator further includes a directional valve providing selective fluid communication of said pump with said hydraulic pressure accumulator.

22. The torque transmitting apparatus as defined in claim 1, wherein said hydraulic clutch actuator further includes a control valve providing selective fluid communication between said hydraulic pressure accumulator and said at least one friction clutch assembly for selectively setting said clutch assembly in said engaged condition.

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23. A torque transmitting apparatus comprising:

a housing rotatably supporting a differential assembly and a drive pinion provided for rotating said differential assembly;

said differential assembly including a differential case and at least one output shaft;

10 a friction clutch assembly for selectively engaging and disengaging said differential case and said at least one output shaft;

a hydraulic clutch actuator for operating said friction clutch assembly between a disengaged condition and an engaged condition; and

a fluid reservoir disposed in said housing for storing a supply of said hydraulic fluid;

15 said hydraulic clutch actuator including a hydraulic pump mounted within said housing about a pinion shaft of said drive pinion and providing a hydraulic fluid under pressure, a hydraulic pressure accumulator mounted to said housing and selectively communicating with said pump for charging said accumulator with said hydraulic fluid under pressure, a directional valve mounted within said housing and provided for selectively

20 directing the hydraulic fluid from said pump to said hydraulic pressure accumulator and from said hydraulic pump to said fluid reservoir, a solenoid-operated control valve mounted within said housing and providing selective fluid communication between said hydraulic pressure

5                    accumulator and said friction clutch assembly for selectively setting said clutch assembly in said engaged condition, and an electronic control module actuating said control valve in response to an activation of an anti-lock braking system of a vehicle;

                  said hydraulic pump being activated in response to rotation of said drive pinion; and

                  said fluid reservoir being in fluid communication with said hydraulic pump.